THE WILDLAND FIRE AIR QUALITY RESPONSE PROGRAM AND PLANNING FOR SMOKE FROM PRESCRIBED FIRE

Presented by
Pete Lahm, Air Resource Specialist
Forest Service, Washington, DC

Partners in this effort:
USFS, NPS, NOAA NWS, EPA,
State and local agencies
and many others…

Wildland Fire Air Quality Response Program

- Interagency response (2011-Present)
- Operationally addressing wildfire smoke
  - Public health
  - Transportation safety
  - Fire personnel exposure
- Four components:
  - Modeling
  - Monitoring
  - Communication
  - Active Coordinated Response
- Integration / coordination
  - EPA, NOAA, NASA, States, and beyond

Modeling

- USFS PNW R&D AirFire Team -BlueSky smoke modeling framework

- 20+ daily regional runs to supplement national products

- NWS 1-km domains provides vast improved model performance (in AZ and GA now)

- New 1-km domains- OR, AZ, NM and now 3-km CONUS

- Focus on high resolution and customization for best performance

King Fire 2014

Earth Observatory 9/17/2014

BlueSky Daily Run

BlueSky: Daily Smoke Predictions

- Supporting Smoke Management and Incident Command Teams (USFS & many partners)
- **NWS FW (mobile):**
  - **1.33-km – Was FL, now GA and AZ tomorrow**
- DRI:
  - 2-km CA/NV,
  - 6-km West US
- UW:
  - 1.33-km WA/OR/ID,
  - 4-km NW
- NWS:
  - 3-km, 12-km CONUS,
 - 12-km AK
- UofA:
  - 1.8-km AZ/NM (in process)

http://www.airfire.org/data/bluesky-daily/

Monitoring

- Cache of 30 PM2.5 monitors – 10 donated…EPA, FWS, FS
- Ordered through supply and at Rocky Mt. National Cache
- Rapid deployment to affected communities
- Real-time telemetry
- Data available to all interested parties
- Development of analytical tools by PNW AirFire Team
- MTDC, PNW and ARA's to test new devices for program use
- State, local and tribal monitors? Preparedness for ARA use?

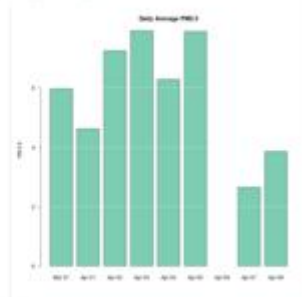# Monitoring Site for Air Quality Management

- USFS developed

- Ingests AirNow and temporary data (e.g. deployed for wildfires & Rx)

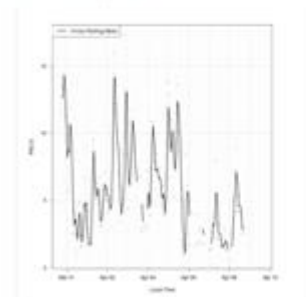- Targeted utility
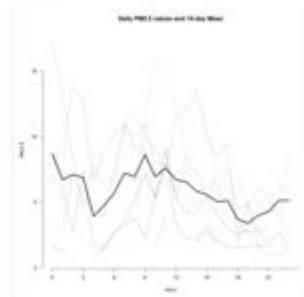
- Easy to use

- Easy to bookmark
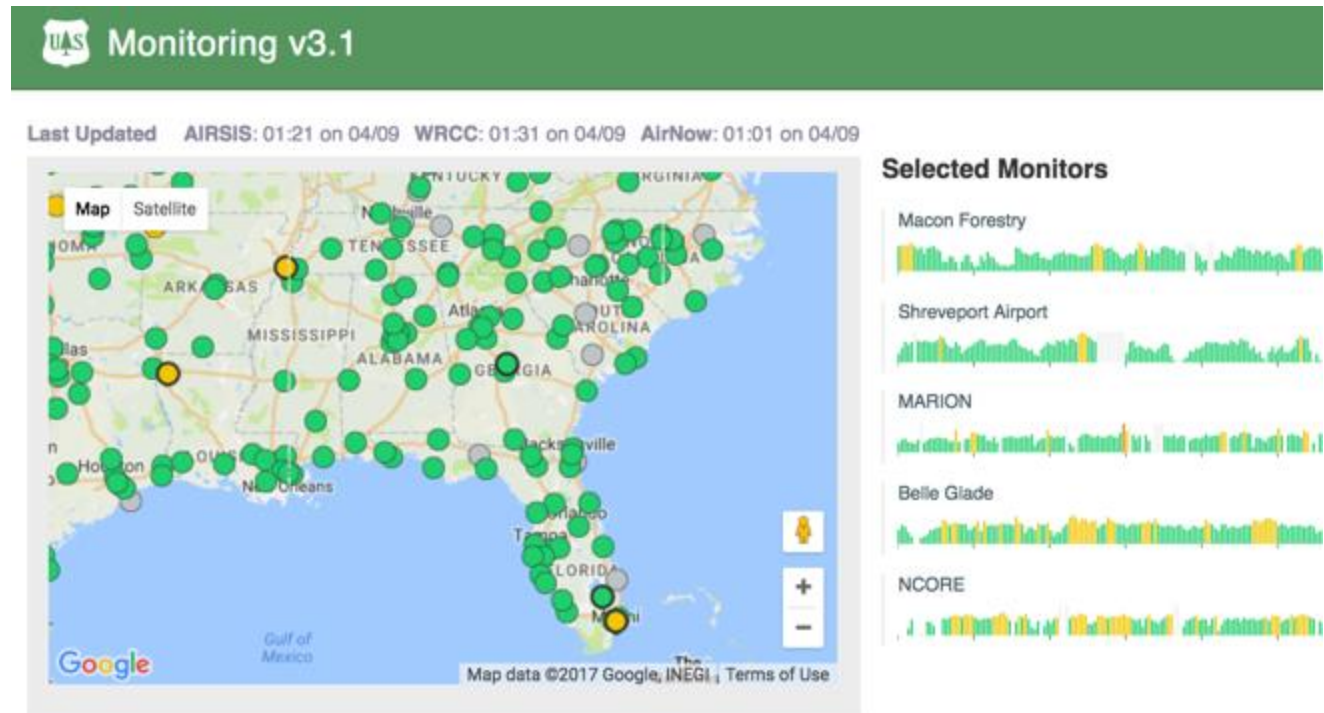
Communications

- **Create Smoke Outlooks and Impact Summaries**

  - **Goal: Reduce exposure through behavior modification**

- Work closely with public health agencies

- Sync communications across impacted areas, and incident commands

- Provide critical additional information:

  - Monitor data

  - Fire activity and burnout operations

  - Fire behavior predictions

  - Meteorology

  - Incident command decisions

  - **State, APCD needs for Exceptional Event Rule Demonstrations**

- PIO info and posting on net, Inciweb, blogs, social media

- Coordinate with partners on traffic smoke impact response efforts
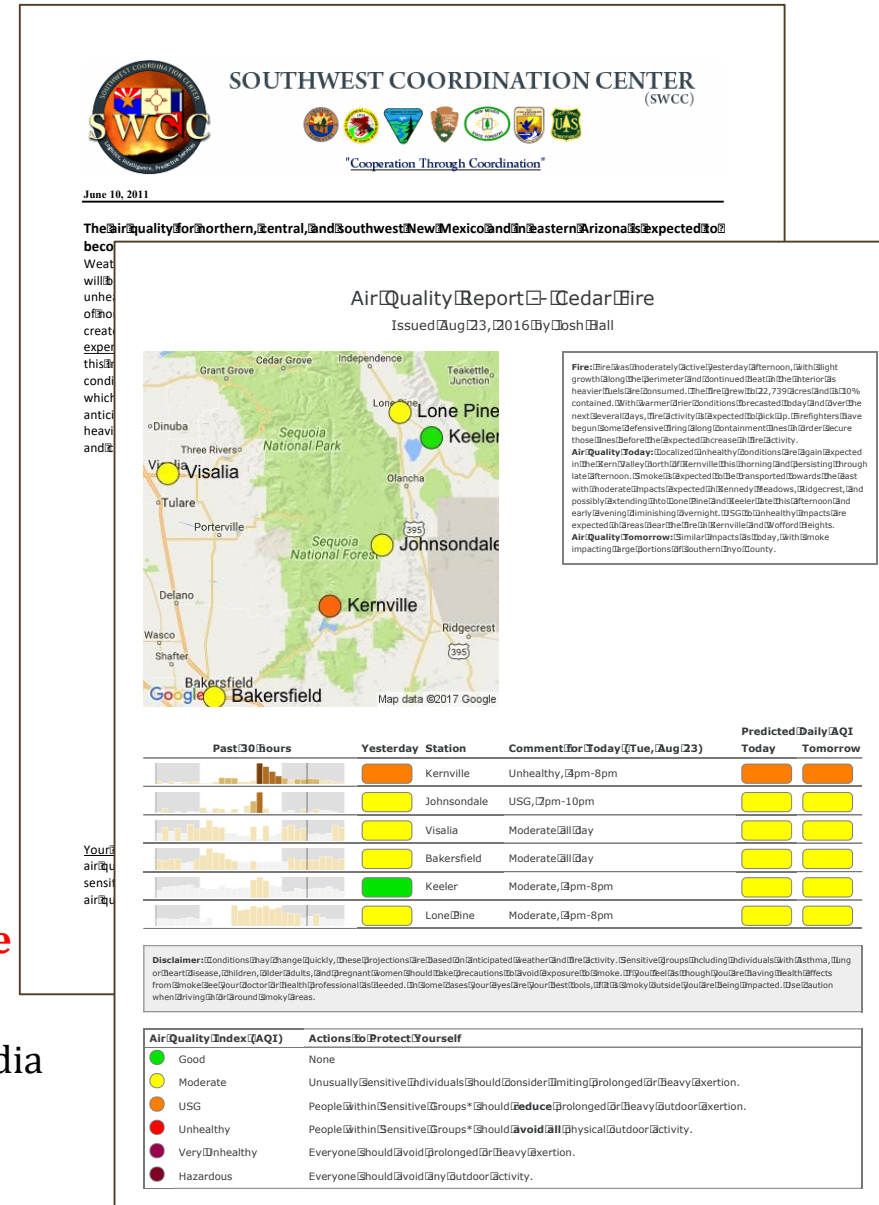
Air Resource Advisors

Smoke specialists deployed as part of an Incident Management Team (THSP in ICS)

Roughly 30 ARA's and 23 Trainees

Training: 2013, 2014, 2015, 2016, 2017…

By far, most orders in West

Enables:

- Smoke informs Incident decisions

- Allows incident decision information to be made available for modeling, etc…

- Develops smoke outlooks and other documents for communications

- Works with state/tribal/local agencies, public and communities – some locations creating ARA Guides (Colville Tribe, State Response Plans)
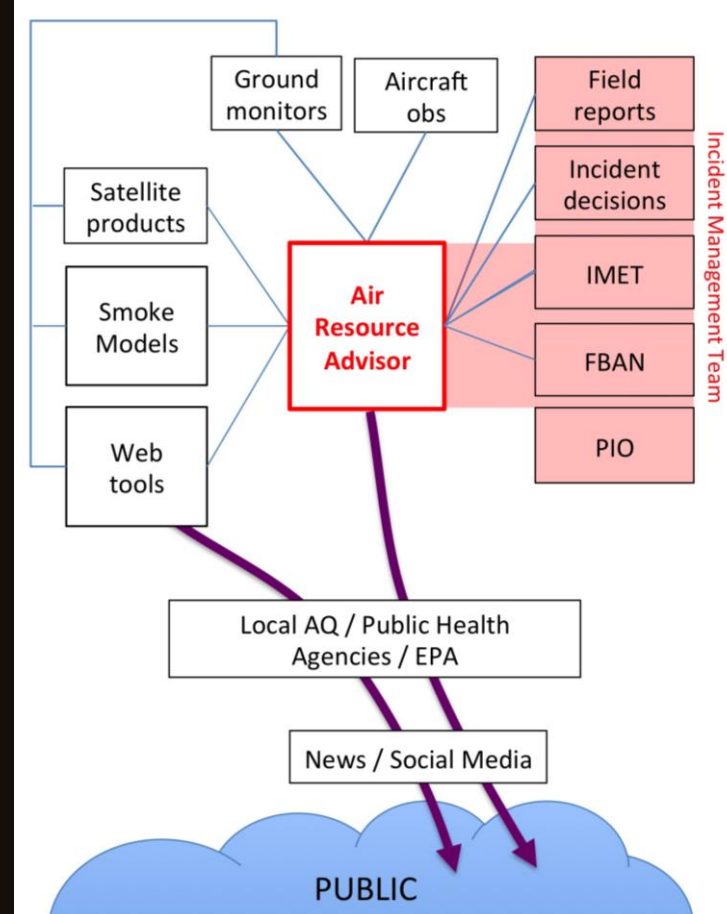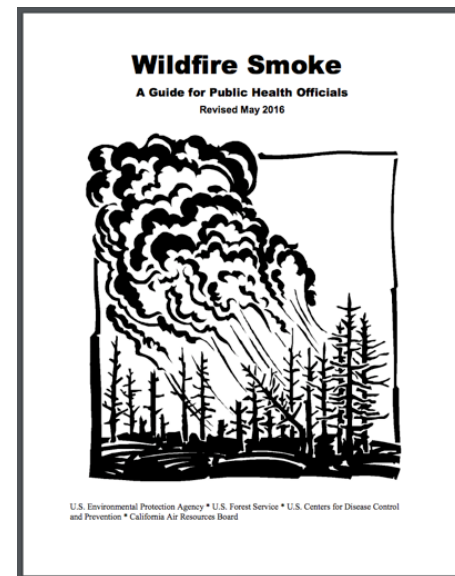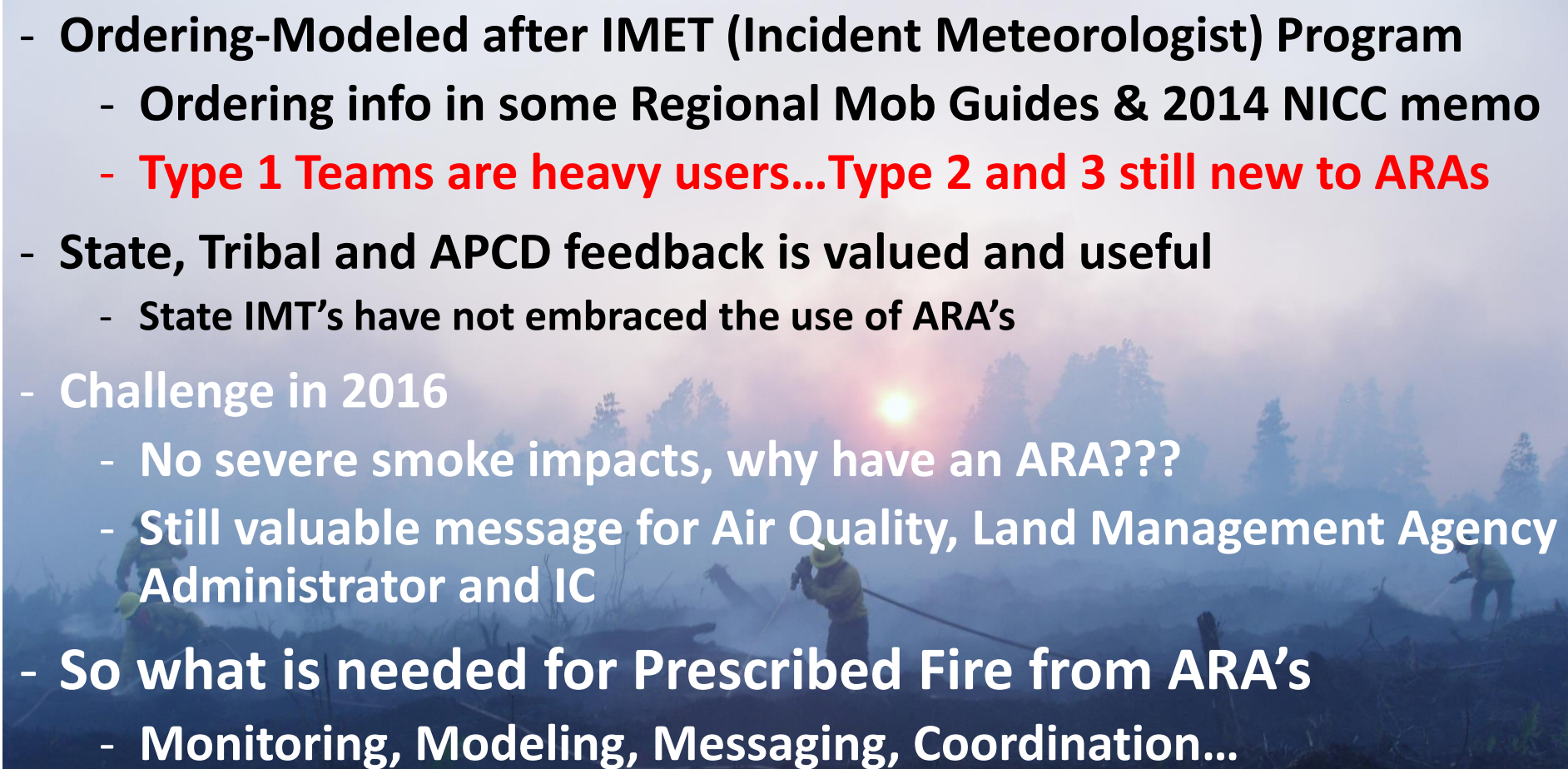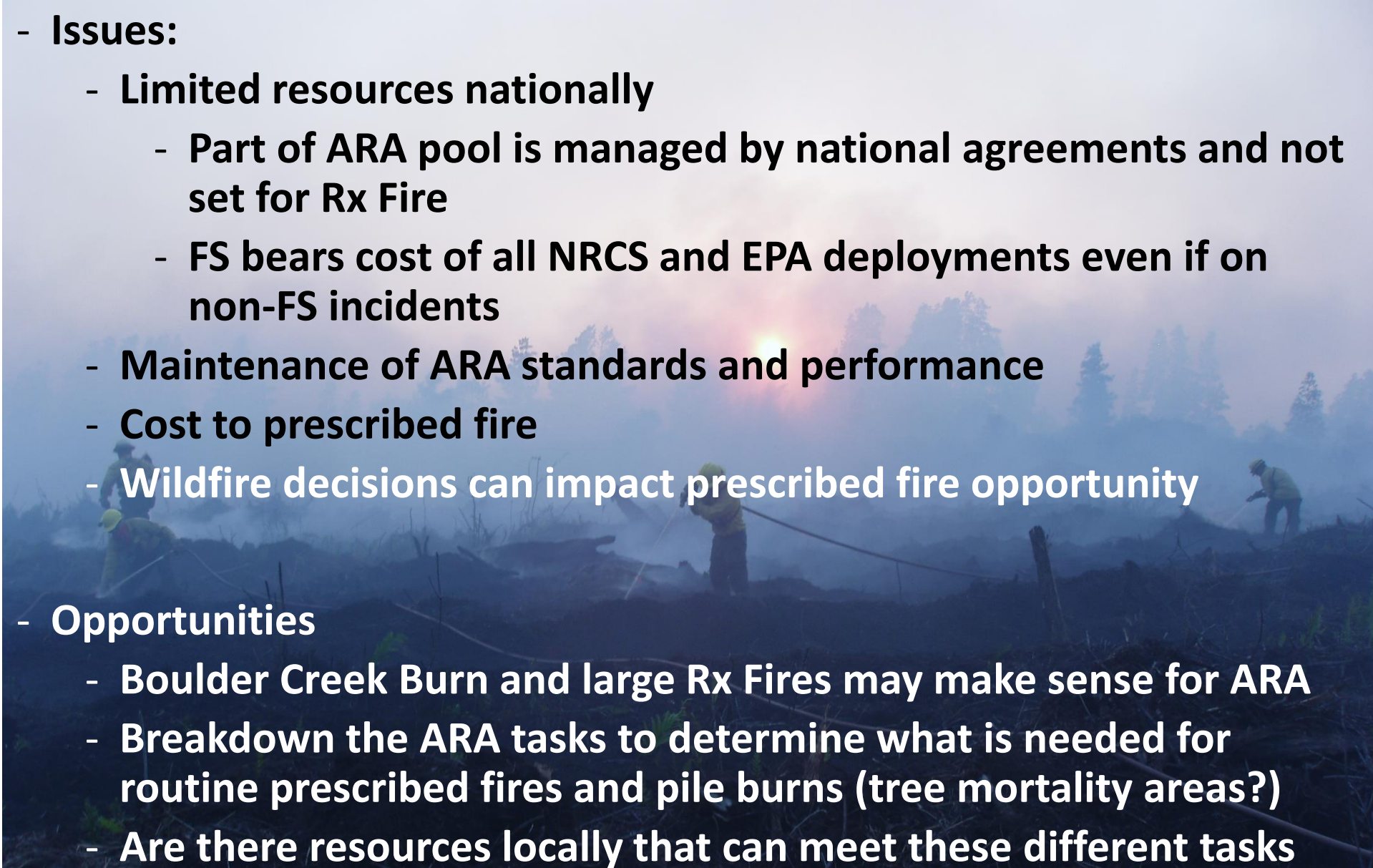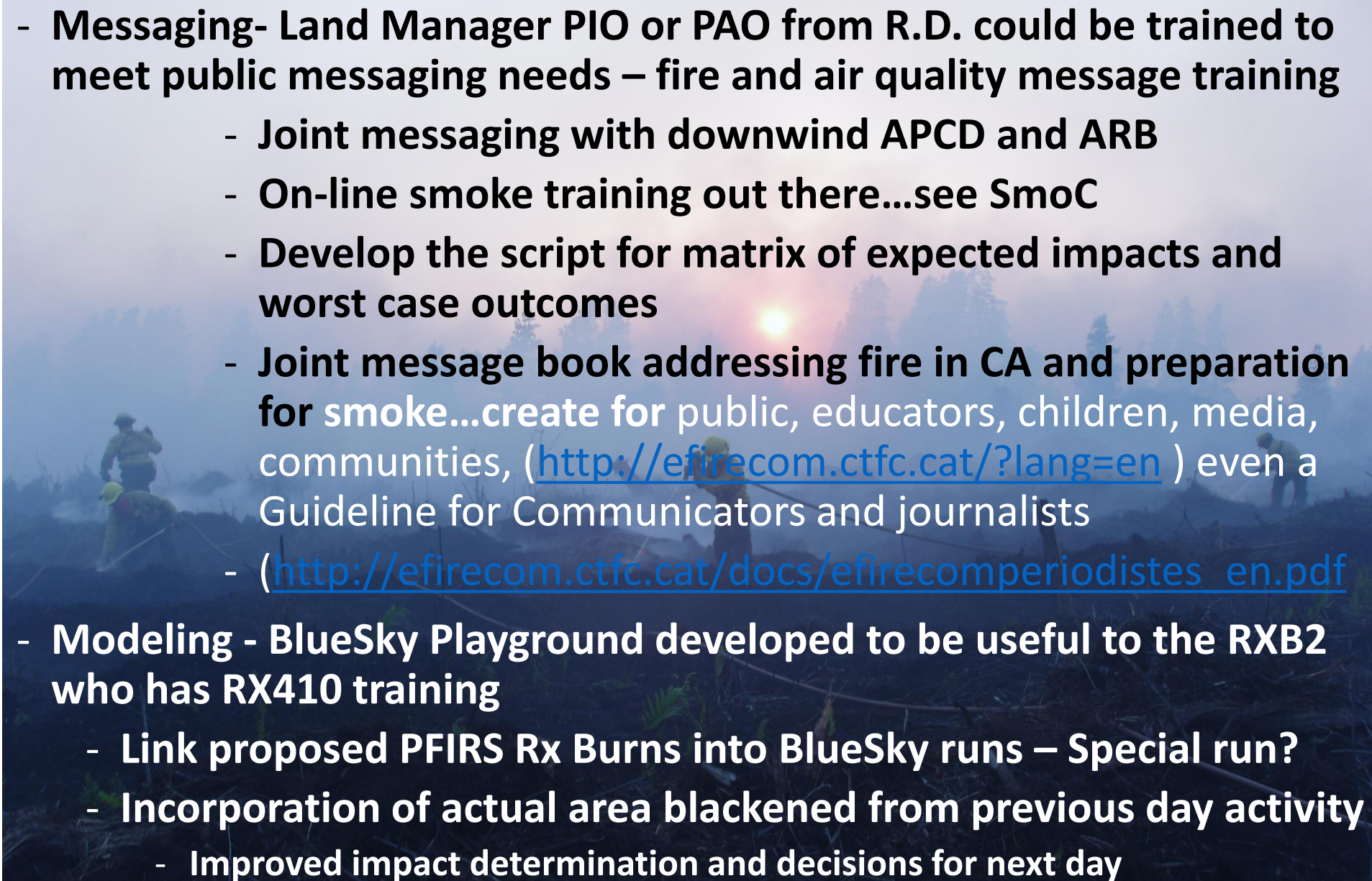

ARA Deployments by Year
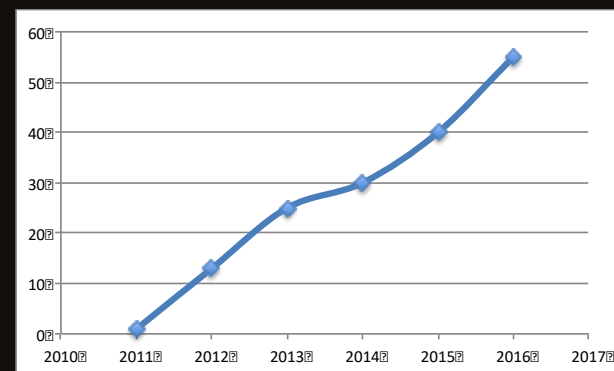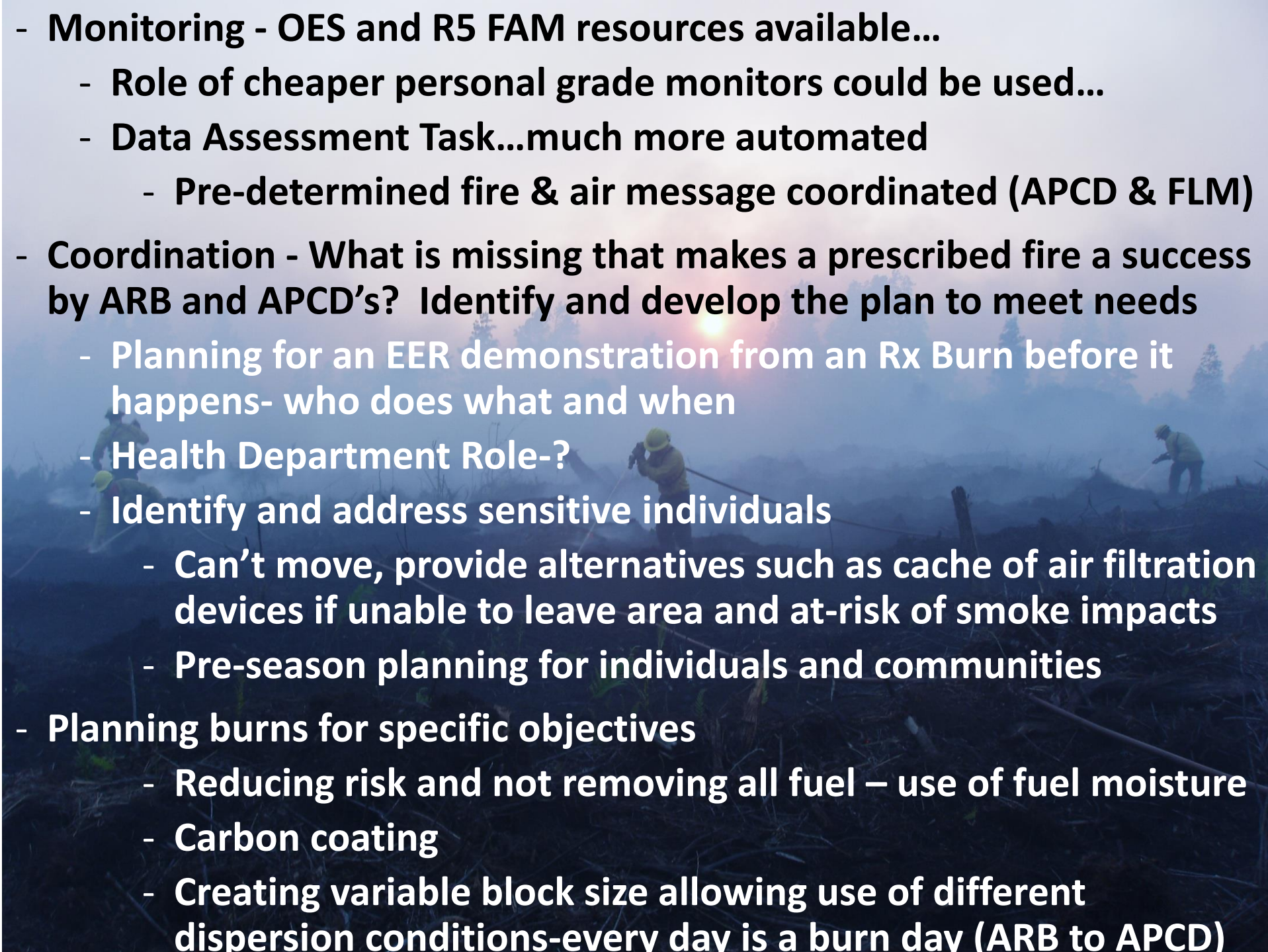
Resources for Smoke and Fire

- Smoke Management Reference Guide revision of 2001 version out soon
- NWCG Smoke and Transportation Safety Guidebook V1 available and under revision but with recent smoke on road issues worth review
- Smoke Exposure Guide and video on Know the Hazards of Smoke (WFSTAR)
  - Will be included in the new S-190
- Wildfire Smoke: A Guide for Public Health Officials
  - EPA, CDC, Forest Service and CARB revised 2016
  - New version late 2017 with updated format and one-page handout sheets
  - https://www3.epa.gov/airnow/wildfire_may2016.pdf
- Building Agency Administrator, PIO and PAO knowledge of smoke and AQ.
  - Smoke Management and Air Quality for Land Managers online
- FS funding a US-wide superfog climatology assessment
  - Determine frequency of superfog conditions in US
- PB Piedmont Web now online for Beta testing for US
  - Testers by request
- Wind Ninja Smoke soon ready for Beta testing
- RX410 now required for all DOI RXB2
- SmoC Notes, webinars, ppts, etc. on Smoke Emissions Portal (U of ID)
  - https://www.frames.gov/partner-sites/emissions-and-smoke/smoc_air_and_fire/

Wildfire Smoke
A Guide for Public Health Officials
Revised May 2016

U.S. Environmental Protection Agency * U.S. Forest Service * U.S. Centers for Disease Control and Prevention * California Air Resources Board

- Ordering-Modeled after IMET (Incident Meteorologist) Program
  - Ordering info in some Regional Mob Guides & 2014 NICC memo
  - Type 1 Teams are heavy users…Type 2 and 3 still new to ARAs
- State, Tribal and APCD feedback is valued and useful
  - State IMT's have not embraced the use of ARA's
- Challenge in 2016
  - No severe smoke impacts, why have an ARA???
  - Still valuable message for Air Quality, Land Management Agency Administrator and IC
- So what is needed for Prescribed Fire from ARA's
  - Monitoring, Modeling, Messaging, Coordination…

- Issues:
    - Limited resources nationally
        - Part of ARA pool is managed by national agreements and not set for Rx Fire
        - FS bears cost of all NRCS and EPA deployments even if on non-FS incidents
    - Maintenance of ARA standards and performance
    - Cost to prescribed fire
    - Wildfire decisions can impact prescribed fire opportunity

- Opportunities
    - Boulder Creek Burn and large Rx Fires may make sense for ARA
    - Breakdown the ARA tasks to determine what is needed for routine prescribed fires and pile burns (tree mortality areas?)
    - Are there resources locally that can meet these different tasks

- Messaging- Land Manager PIO or PAO from R.D. could be trained to meet public messaging needs – fire and air quality message training
    - Joint messaging with downwind APCD and ARB
    - On-line smoke training out there…see SmoC
    - Develop the script for matrix of expected impacts and worst case outcomes
    - Joint message book addressing fire in CA and preparation for **smoke…create for** public, educators, children, media, communities, (http://efirecom.ctfc.cat/?lang=en) even a Guideline for Communicators and journalists
    - (http://efirecom.ctfc.cat/docs/efirecomperiodistes_en.pdf
- Modeling - BlueSky Playground developed to be useful to the RXB2 who has RX410 training
    - Link proposed PFIRS Rx Burns into BlueSky runs – Special run?
    - Incorporation of actual area blackened from previous day activity
        - Improved impact determination and decisions for next day

- Monitoring - OES and R5 FAM resources available…
  - Role of cheaper personal grade monitors could be used…
  - Data Assessment Task…much more automated
    - Pre-determined fire & air message coordinated (APCD & FLM)
- Coordination - What is missing that makes a prescribed fire a success by ARB and APCD's? Identify and develop the plan to meet needs
  - Planning for an EER demonstration from an Rx Burn before it happens- who does what and when
  - Health Department Role-?
  - Identify and address sensitive individuals
    - Can't move, provide alternatives such as cache of air filtration devices if unable to leave area and at-risk of smoke impacts
    - Pre-season planning for individuals and communities
- Planning burns for specific objectives
  - Reducing risk and not removing all fuel – use of fuel moisture
  - Carbon coating
  - Creating variable block size allowing use of different dispersion conditions-every day is a burn day (ARB to APCD)

Improved Mobile App Development

- Targeted information
- Alerts
- Potential for advanced visual range tools
- Multiple agencies (EPA, CDC USFS, JFSP, NPS,etc…)

.ıll CARRIER

AirNow   Smoke in your area

Current
- No Heath Alerts
- Air Quality Conditions are Good
- Nearest Fires are 70 mi SW
- No Smoke Plumes Detected

Forecast
▶▶ Smoke expected tonight and tomorrow morning

OK   Mt. Hood - 49 mi
75 mi   Mt. Jefferson - 95 mi
Wells Fargo Center - 1 mi
KOIN Center - 2 mi

Summary   Map   Visual Range   Info

Public Webinars
May 8, 2017 at 1 pm EDT
May 16, 2017 at 8 am EDT

Wildland Fire Sensors Challenge

Partnering federal organizations:

Wildland Fire Sensors Challenge

Shared vision by partnering organizations:

A desire to advance air measurement technology to be **easier to deploy**, suitable to use for **high concentration events**, **durable** to withstand difficult field conditions, and report data **continuously and wirelessly**. Desired measurements: $PM_{2.5}$, O_3, CO, CO_2.

https://www.innocentive.com/ar/challenge/9933927
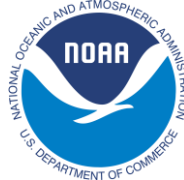
THE WILDLAND FIRE AIR QUALITY RESPONSE PROGRAM

Pete Lahm, Program Lead
Forest Service
Fire and Aviation Management
Washington, D.C.
202-205-1084 // **602-432-2614 cell**
661-GET-1ARA
Plahm@fs.fed.us // pete.lahm@gmail.com
Website: wildlandfiresmoke.net